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REDESCRIPTION OF *STICHOPATHES POURTALESI* BROOK, 1889 (CNIDARIA: ANTHOZOA: ANTIPATHARIA: ANTIPATHIDAE)

MARZIA BO[1] AND DENNIS M. OPRESKO[2]

ABSTRACT. *Stichopathes pourtalesi* Brook, 1889, the type species of the genus *Stichopathes* Brook, is redescribed on the basis of an examination of the type material originally identified by de Pourtalès as *Antipathes desbonni* Duchassaing and Michelotti and as *Antipathes spiralis* Pallas. Because the type series consists of multiple species, it was necessary to select a lectotype to clearly define the species. The species is characterized by a spiral, unbranched corallum; triangular, compressed spines, some of which have one or more lobes at the apex; very faint elongate papillae on the surface of the spines extending from near the apex to as much as one-half the distance to the base; and large polyps with long tentacles (in preserved specimens). The species is similar to *Stichopathes gracilis* (Gray); however, scanning electron microscopy indicates that there are distinct differences between the two species in the microscopic surface ornamentation of the spines.

KEY WORDS: black corals; morphology; taxonomy; syntypes; lectotype; paralectotypes

INTRODUCTION

In 1889 Brook established the genus *Stichopathes* and included within it seven species: *S. pourtalesi* Brook, 1889, *S. gracilis* (Gray, 1857), *S. echinulata* Brook, 1889, *S. desbonni* (Duchassaing and Michelotti, 1864), *S. occidentalis* (Gray, 1860), *S. filiformis* (Gray, 1868) and *S. luetkeni* Brook, 1889 (original spelling lütkeni). Brook did not specifically state which of the seven species he considered the type species of the genus; however, in his description of the genus he refers to information provided by de Pourtalès on the polyps of specimens that de Pourtalès had identified in 1872 and 1874 as *Antipathes desbonni* Duchassaing and Michelotti and also those he identified in 1880 as *Antipathes spiralis* Pallas, 1766. Brook (1889: 88) notes that he established the genus "in consequence of what Pourtalès says about his *Cirrhipathes spiralis* (Pourt. *non* Pall.), and in order to distinguish those unbranched

[1] Università degli Studi di Genova, Genova, Italy; e-mail: marzia.bo@unige.it.

[2] U.S. National Museum of Natural History, Smithsonian Institution, Washington, D.C., U.S.A.; e-mail: dmopresko@hotmail.com.

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forms of Antipathinae having polyps on one side of the axis only, from those which, as in the genus *Cirripathes* have them distributed spirally all around the stem." Brook (1889) indicates that all of the other six species that he referred to *Stichopathes* were represented in the British Museum collection by specimens not preserved in alcohol and for which the polyps "were not available for study." For two of these species, *S. echinulata* and *S. gracilis,* the polyps were described as being distributed in a single row; however, Brook provides no additional information. The species that Brook discusses first in his monograph is *S. pourtalesi*, and because the type species was always the first species of a genus discussed (e.g., in the case of *Antipathella*, *Aphanipathes*, *Tylopathes*, *Schizopathes*, *Bathypathes*, *Taxipathes*, and *Cladopathes*), it must be concluded that he considered *S. pourtalesi* the type species of the genus. Because Brook's establishment of the genus *Stichopathes* was based solely on de Pourtalès' description (Brook did not examine any of the material de Pourtalès identified as *A. desbonni* or *A. spiralis*), and because de Pourtalès' description is limited in scope and was based on numerous specimens representing multiple species, it is necessary to redescribe and clearly define the species and to select an appropriate lectotype.

MATERIAL AND METHODS

This report is based on specimens identified by de Pourtalès in 1874 and 1878 as *A. (C.) desbonni* (that he reassigned in 1880 to *A. spiralis*), as well as additional specimens collected during the "Blake" Expedition to the Caribbean that de Pourtalès identified in his 1880 paper as *A. spiralis*. Almost all of de Pourtalès' material is housed at the Museum of Comparative Zoology (MCZ) at Harvard University. At least three specimens are known to be in the collections of the U.S. National Museum of Natural History (NMNH), Smithsonian Institution and one sample in the collections of the Natural History Museum, London (BM).

Photographs of the skeletal spines were made using a scanning electron microscope (SEM) housed at the NMNH. Analysis of the morphometrics of the skeletal spines was conducted from direct examination of the material using a low-power ocular microscope or by direct examination of photographs taken with the SEM.

Abbreviations: MCZ (Museum of Comparative Zoology); NMNH (U.S. National Museum of Natural History, Smithsonian Institution); BM (The Natural History Museum, London); USNM (prefix for NMNH catalogue numbers).

Stichopathes Brook, 1889

Type Species. Stichopathes pourtalesi Brook, 1889

Diagnosis. Monopodial unbranched corallum (rarely secondarily branched following regeneration of the broken stem), stem straight, wavy, curved, or partially (upper part of stem) or entirely spiral. Polyps confined to a regular, single row on one side of axis. Spines triangular to conical, smooth or papillose, and simple, bifurcated, or with multiple knobs or lobes at apex.

Remarks. The family Antipathidae currently contains three genera of unbranched antipatharians: *Stichopathes* Brook, 1889; *Cirrhipathes* Blainville 1834; and *Pseudocirrhipathes* Bo & Bavestrello, 2009 (*in* Bo et al., 2009). In *Stichopathes* and *Pseudocirrhipathes*, the polyps tend to be confined mainly to one side of the axis, whereas in *Cirrhipathes* the polyps occur in multiple rows that often cover about three-quarters of the circumference of the axis, leaving only a small portion free. *Pseudocirrhipathes* is distinguished from *Stichopathes* by the fact that the polyps tend to be arranged in

irregular rows on one side of the axis, whereas those in *Stichopathes* are in a straight, regular row (Bo et al., 2012).

Stichopathes pourtalesi Brook, 1889 (Figures 1–5)

Syntypes. In his 1874 paper de Pourtalès indicates that material he identified as *A. desbonni* was collected at one station off Barbados, and in his 1878 paper he lists four stations where material identified as the same species had been collected off Sand Key, Florida (see Table 1). In his 1880 paper, de Pourtalès states that the specimens he previously identified as *A. desbonni* he now considered as *A. spiralis* Pallas. He further states that this same species was very common, having been collected at 23 stations in depths ranging from 45 to 878 fm off Havana, Santa Cruz, Montserrat, Martinique, St. Vincent, the Grenadines, Grenada, and Barbados. On the basis of an inventory of antipatharians in the MCZ collection dated June 1969, as well as of identifications written on the original labels, and an examination of material at the NMNH, the specimens of the type series and the stations at which they were collected were identified (see Table 1).

It should be noted that 18 Blake stations corresponding to de Pourtalès' 1880 publication are shown in Table 1, whereas de Pourtalès mentions that the species was collected at 23 stations. Either the specimens from five stations were lost or donated to other institutions without records being kept, or, more likely, de Pourtalès was including, in the total of 23 stations, the single station mentioned in his 1874 paper and the four listed in his 1878 paper, in which case all 23 stations would be accounted for. Of the stations listed above, only the specimen from Blake Sta. 249, listed in the 1969 MCZ inventory, could not be found.

Although specimens in the type series were collected at 23 stations, over the years, samples from some of these stations were subsorted, reidentified, and given separate MCZ catalogue numbers (this information was never published). Because some of the lots consisted of broken pieces of colonies, it is possible that parts of the same colony were catalogued as separate specimens, and equally possible that parts of different colonies were catalogued under the same registry number.

In total, we analyzed 32 lots, and because some contained more than one colony or multiple fragments representing more than one specimen, we identified 51 different specimens, of which 20 have been assigned to *S. pourtalesi sensu stricto* (Table 2). All of the remaining specimens in the original type series represent different species. Until a complete taxonomic revision of the genus is completed, no attempt will be made to assign these specimens to specific taxa; however, similarities to other nominal species will be pointed out where possible.

de Pourtalès Descriptions. In his 1874 description of *A. desbonni*, de Pourtalès reports that his specimens are 50–55 cm long, not much more than 1 mm in diameter at the base; densely covered with small spines, and with polyps that are of the type with long tentacles, confined to one side of the stem and alternately large and small. In his 1878 description he adds that the colonies are always spiral, the spines are in six rows (presumably counting those only visible in one view), the polyps cover four of those rows, and that the tentacles are large and fleshy. In his 1880 paper he elaborates that the spirals are 10 to 20 cm in diameter; can be either right to left or the reverse, or change from one to the other in the same colony; that the spines are short, triangular, compressed, and arranged in a quincunx; and that the coensarc on the side of the stem opposite the polyps shows transverse canals

TABLE 1. STATION DATA AND MUSEUM CATALOGUE NUMBERS FOR THE SYNTYPES OF *STICHOPATHES POURTALESI.*

Expedition (Reference)	Station Number and Date	Locality	Coordinates	Depth, fm (m)	Lot(s)
Hassler Expedition (de Pourtalès, 1874)	na	off Barbados	Na	100 (183)	MCZ 90357; 66251; 66385
(de Pourtalès, 1878)	na	off Sand Key, FL, Sigsbee	Na	45 (82)	MCZ 90361 (USNM 100393)
(de Pourtalès, 1878)	36	na	23°13′N, 89°10′W	84 (154)	MCZ 90365; 66253
(de Pourtalès, 1878)	na	off Havana (Sigsbee)	na	127 (232)	MCZ 90362
(de Pourtalès, 1878)	35	north of Alacran Reef, Yucatan, Mexico	23°52′N, 88°58′W	804 (1470)	MCZ 90347
Blake Expedition (de Pourtalès, 1880)	131	off Santa Cruz, U.S. Virgin Islands	na	580 (1060)	MCZ 90344 (BM 1948.3.5.10)
(de Pourtalès, 1880)	132 5 January 1879	off S. Croix	17°37′55″N, 64°54′20″W	117 (214)	MCZ 90340
(de Pourtalès, 1880)	144 (or 163)	off Sabo Bank (or Guadeloupe)	na	21–878 (38–1606)	MCZ 90341
(de Pourtalès, 1880)	155 16 January 1879	off Montserrat	16°41′54″N, 62°13′24″W	88 (161)	MCZ 90352; 90353; 90354; (USNM 5861)
(Pourtalès, 1880)	156 16 January 1879	off Montserrat	na	88 (161)	MCZ 90342
(de Pourtalès, 1880)	157	off Montserrat	na	120 (219)	MCZ 90343
(de Pourtalès, 1880)	158 16 January 1879	off Montserrat	16°41′54″N, 62°13′24″W	148 (271)	MCZ 90351
(de Pourtalès, 1880)	193 5 February 1879	off Martinique	14°43′48″N, 61°11′25″W	169 (309)	MCZ 90345; 90346
(de Pourtalès, 1880)	203 10 February 1879	off Martinique	14°28′50″N, 61°05′40″W	96 (176)	MCZ 90355; 90360; 66387
(de Pourtalès, 1880)	231 20 February 1879	off St. Vincent-Grenadines	13°12′10″N, 61°17′18″W	95 (174)	MCZ 90349; 90350; (USNM 5862)
(de Pourtalès, 1880)	240	off St. Vincent, Grenadines	12°32′45″N, 61°29′15″W	164	MCZ 90348
(de Pourtalès, 1880)	249	off St Vincent		124	specimen not found
(de Pourtalès, 1880)	253 27 Febraury 1879	off Grenada	11°25′0″N, 62°04′15″W	96	MCZ 90363
(de Pourtalès, 1880)	269 3 March 1879	St. Vincent–Grenadines	13°07′55″N, 61°05′36″W	124	MCZ 90359; 90364

TABLE 1. CONTINUED.

Expedition (Reference)	Station Number and Date	Locality	Coordinates	Depth, fm (m)	Lot(s)
(de Pourtalès, 1880)	272 5 March 1879	off Barbados	13°04′12″N, 59°36′05″W	76	MCZ 90358
(de Pourtalès, 1880)	290 9 March 1879	off Barbados	13°11′54″N, 59°39′45″W	73	MCZ 90337; 90338; 66386
(de Pourtalès, 1880)	296 10 March 1879	off Barbados	13°05′24″N, 59°38′45″W	84–85	MCZ 90339
(de Pourtalès, 1880)	298 10 March 1879	off Barbados	13°03′28″N, 59°37′40″W	120	MCZ 90356

between the polyps that are more transparent than the rest of the tissue. de Pourtalès further notes that the largest specimen is 3.20 m long and 4–5 mm in diameter at the base. In his 1880 paper de Pourtalès provides illustrations of the polyps and spines of a specimen he assigned to *A. spiralis*, although the specimen was not specifically identified (nor was the station at which it was collected). On the basis of these illustrations (see Figs. 1A, B), the larger polyps can be estimated to be about 1.5 mm in transverse diameter, with three occurring along 4.5 mm of axis (a total of five or six polyps per 4.5 mm of axis, if smaller polyps between the larger ones are included). The illustration of the spines is of low magnification and low resolution, and only a very rough estimate of the size of the spines can be made. The largest spines appear to be about 0.1 mm tall and arranged in irregular rows, with five or six rows visible. No surface features are discernable, and de Pourtalès does not mention any in the text. There is no certainty as to whether the illustrations of the polyps and spines were based on samples taken from the same specimen.

Designation of a Lectotype. The key taxonomic features that Brook (1889) used to establish the genus *Stichopathes* were the arrangement of the polyps in a single row and the very long digitiform tentacles that de Pourtalès stated were characteristic of the specimens he identified as *A. spiralis*. Brook (1889) lists the de Pourtalès 1880 paper first in the synonymy of *S. pourtalesi*, and it is only in the 1880 paper where de Pourtalès presents an illustration of the polyps. In selecting a lectotype for *S. pourtalesi* the primary consideration was to find a specimen from the type series whose polyps conform to these illustrations, and also one that was part of the material reported on by de Pourtalès in 1880. Of the specimens of the type series examined, it was decided that one

TABLE 2. MAIN TAXONOMIC CHARACTERS FOR THE SYNTYPES IDENTIFIED AS *STICHOPATHES POURTALESI SENSU STRICTO*.

	Corallum			Spines[2]				Polyps	
Catalogue No.[1]	Shape	Part and Length (cm)[3]	Max. Stem Diam. (mm)	Height (mm)	Distance Apart (mm)	No. Rows	Notes on spines	Max. Transverse Diam. (mm)	Density (No. per Centimeter)
MCZ 66253	straight	apex, 5	na	0.12/0.10	0.6	four	few papillae		
MCZ 66387	straight	apex, 10	0.8	0.10/0.10	0.4	five	papillose, some bifid		
MCZ 90342	coiled fragments	apex, 43	0.7	0.17/0.06	0.6	seven to eight	papillose, some bifid	1.5	six
MCZ 90343 (1)	coiled fragments	entire, 470	5.0	0.14/0.08	0.6	five to six	papillose, some bifid	1.5	five to six
MCZ 90343 (2)	coiled fragments	apex, 95	1.0	0.12/0.10	0.4	six	few papillae, some bifid	1.0	six to seven
MCZ 90347	coiled fragments	apex, 63	0.5	0.20/0.16	0.8	four to five	papillose, some bifid		
MCZ 90348	coiled fragments	entire, 80	1.7	0.20/0.12	0.8	six	few papillae		
MCZ 90353	coiled fragments	base, 63	2.0	0.12/0.08	0.8	five to seven	papillose, some bifid	1.5	four to five
MCZ 90355	coiled fragments	entire, 73	3.0	0.16/0.10	0.6	four to six	papillose, some irregular	1.0	six to seven
MCZ 90356	coiled fragments	apex, 120	2.0	0.16/0.10	0.6	six	few papillae	1.7	five to six
MCZ 90357 (1)	coiled	entire, 32	0.7	0.10/0.04	0.4	six	papillose		
MCZ 90357 (2)	straight fragments	mid?, 26	0.6	0.12/0.10	0.3	five to six	papillose, some bifid	1.0	six
MCZ 90357 (3)	straight	entire, 3	0.3	0.12/0.08	0.3	five	papillose, some bifid		
MCZ 90357 (4)	coiled fragments	apex, 25	0.4	0.10/0.06	0.3	seven	papillose	0.85 mm	
MCZ 90358 (1)	straight	entire, 12	0.8	0.12/0.08	0.3	five	papillose		
MCZ 90358 (2)	coiled	entire, 26	1.2	0.12/0.08	0.4	six	papillose		
MCZ 90358 (3)	coiled fragments	apex, 110	3.0	0.10/0.07	0.6	six	papillose, some bifid	1.3	five
MCZ 90358 (4)	coiled fragments	apex, 14	0.9	0.14/0.08	0.3	six	papillose		
MCZ 90361 (1)	straight	entire, 9	0.3	0.16/0.10	0.4	five to six	papillose	0.65 mm	
MCZ 90361 (2)	straight	entire, 8	0.4	0.16/0.10	0.4	five to six	papillose	1.5	five to six

[1]Numbers in parentheses designate specific specimens in same lot as assigned by study authors.
[2]Height of spines is indicated for polypar/abpolypar sides of axis, respectively.
[3]Length of corallum is given for entire reconstructed colony or for indicated section only.

from Blake Sta. 156 (MCZ 90342), although not a complete specimen, had polyps almost identical in size and appearance to those in the 1880 publication (see Figs. 1C, D). This specimen was selected as the lectotype of *S. pourtalesi* Brook.

Diagnosis. Unbranched corallum, either spiral from near base or with lower portion relatively straight and upright and upper portion forming large coils or spirals. Spirals 10 to 20 cm in diameter. Spines triangular to conical, extending out at right angles to axis or slightly inclined distally. Polypar spines usually simple or with slight bifurcation at apex; mostly 0.14–0.17 mm tall (maximum about 0.2 mm); lateral spines in some places with one or more irregular lobes at apex; abpolypar spines simple, reduced in size. Polypar and abpolypar spines with faint, fusiform papillae. Papillae covering spine surface from apex, or just below apex, one-third to one-half distance to base. Spines on thicker parts of stem more often multilobed at tip, and papillae becoming more rounded and distinct. Polyps up to about 1.7 mm in transverse diameter, with long distally directed tentacles; basal section of proximal lateral tentacles extending distally around mouth; proximal lateral tentacles up to about 3 mm long; sagittal tentacles up to 5 mm long (in preserved material); four to seven polyps per centimeter.

Description of Lectotype. The specimen selected as the lectotype (MCZ 90342, Blake Sta. 156) consists of three broken, curved pieces of stem whose total length is 43 cm (19 + 14 + 10 cm) (Fig. 2). The diameter at the lower end is about 0.7 mm. The spines on the polyp side of the axis are compressed and triangular in lateral view (Fig. 3). On a section of stem 0.5 mm in diameter they are up to 0.17 mm tall, and spaced 0.5–0.7 mm apart from each other, resulting in slightly less than three per millimeter. They are simple or with a slight bifurcation at the apex and are orientated at right angles to the axis. Spines occur in seven to eight longitudinal rows (as seen in one view). The spines in the rows lateral to the polypar spines show more distinct bifurcations at the apex and some are multilobed. The abpolypar spines, those directly opposite the polypar spines, are reduced in size, as small as 0.06 mm in places, and simple—without bifurcations or lobes at the apex. Fusiform papillae cover part of the surface of the spines (Figs. 3D, E). The largest papillae are up to about 10 μm long and 2.5 μm wide, and in areas where they are most abundant have a density of about 40 per 1,000 μm^2. They cover the surface from just below the apex to one-third to one-half the distance to the base. On some spines the papillae become less distinct toward the proximal edge of the spines.

The polyps are in a single row on one side of the axis (Figs. 1C, D). They have a transverse diameter up to about 1.5 mm. Small polyps can be found between some of the larger ones. Six polyps occur along 1 cm of axis. The sagittal tentacles are up to about 3.8 mm long and the proximal laterals about 3 mm long. Traces of long sweeper tentacles are visible (up to 5 mm long). The basal section of the proximal lateral tentacles extend distally and are wrapped around the oral cone.

Species Variation. The other 19 specimens in the type series that we assign to *S. pourtalesi*, *sensu stricto,* conform, in general, to the diagnosis given above; however, a certain degree of intraspecific variability is recorded among these specimens (Table 2). Colonies generally show loose coils, although straight sections can be present, especially in very young specimens or at the base of the very long ones. The height of the polypar spines ranges from 0.1 to 0.2 mm, whereas that of abpolypar spines from 0.04 to 0.16 mm. The spines (absent in the basalmost 1 to 2 cm of the stem) are in four to eight longitudinal rows (one view) and within

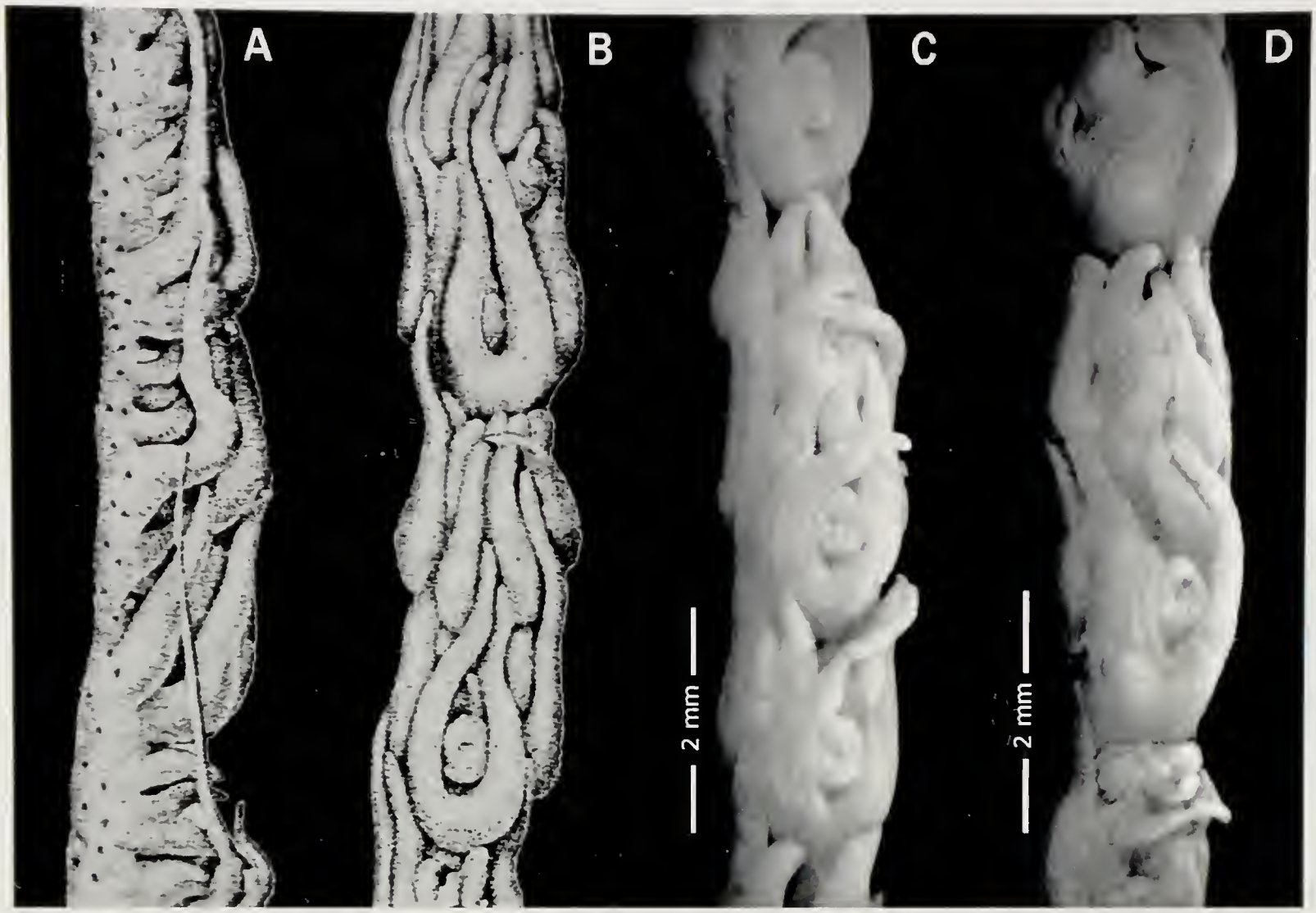

Figure 1. *Stichopathes pourtalesi* Brook. A, B, reproduction of de Pourtalès' illustrations of the polyps of "*Antipathes spiralis*." C, D, polyps of lectotype of *S. pourtalesi* (MCZ 90342).

Figure 2. Lectotype (MCZ 90342) of *Stichopathes pourtalesi* Brook.

each row they are 0.3 to 0.8 mm apart. Papillose spines are present in all specimens; however, the density of the papillae is variable. Bifid and lobate spines are not common and are generally restricted to the thicker portions of both juvenile (less than 20 cm high) and adult colonies. There is no clear difference in height or shape of the spines in colonies of different ages, although spines are usually smaller and less commonly bifid in juvenile specimens. The polyps are 0.6 to 1.7 mm in transverse diameter (from proximal side of proximal lateral tentacles to distal side of distal lateral tentacles) and there are four to seven polyps per centimeter. Sagittal tentacles are up to 5 mm long (including ones that appear to be sweeper tentacles).

The most complete of the larger specimens assigned to *S. pourtalesi* is MCZ 90343 (from Blake Sta. 157). This specimen is broken into 16 coiled pieces, the total length of which is about 470 cm (although the larger, thicker pieces clearly belong to the same colony, the same could not conclusively be determined for all of the smaller apical pieces). The basal section is straight and 4.8 by 5.1 mm in diameter at its lower end, but a holdfast is not present. The uppermost broken piece is 91 cm long and about 0.9 mm in diameter at its lower end, which is curved in the form of a coil about 9 cm in diameter. Intermediate sections form coils up to 20 cm in diameter. On sections of stem ranging in thickness from 0.34 to 1.1 mm the polypar spines are 0.10 to 0.14 mm tall, and the abpolypar spines are about 0.1 mm. Height of spines is slightly greater toward the basal portion of the stem. The spines are in four to eight longitudinal rows (one view), and within each row they are 0.5 to 0.6 mm apart. On apical sections of the stem, the spines tend to show fewer papillae than those of the lectotype (Fig. 4). Spines on thicker sections of the stem show more coarse papillae and multiple lobes at the apex (Fig. 5). The polyps are 1.2 to 1.4 mm in transverse diameter and there are five to six polyps per centimeter.

Taxonomic Comparisons. The species that most closely resembles *S. pourtalesi*, as defined above, is *S. gracilis* (Gray, 1857). The original description of *S. gracilis* is rather brief and consists solely of the following: "slender, tapering, slightly spinose." The type was described in more detail by Brook in 1889, who reported that the colony was curved but not spiral, and that the polyps were arranged in a single row. The spines were described as triangular, compressed, standing out at right angles to the axis, and forked on the thinner parts of the stem, the forked spines eventually splitting into two separate spines on the thicker parts of the axis where "the majority of the spines are now simple, but some are short and broad, having the apex divided into a number of processes giving a serrate appearance." A re-examination of the type specimen in the Natural History Museum (BM Reg. No. 23.1.16.1) revealed that the polyps are about 1.5 to 2.0 mm in transverse diameter with four to five per centimeter. On a sample of the stem 0.64 mm in diameter, the polypar spines are 0.22 mm tall, and the abpolypar spines 0.12 mm tall (Figs. 6A–C). Five to six longitudinal rows are visible in one view, and the spines are about 0.9 mm apart in each row, resulting in only two spines per millimeter in each row. The apex of the spines is round and smooth or has small lobes. Numerous small papillae cover the area from just below the apex to the middle of the spines or slightly below the middle (Figs. 6D, E). The papillae are roundish to oval—in the latter case with the longer of the axes extending in a direction from the apex of the spine to the base. The density of the papillae in the center of the side of the spines was estimated to be about 40 per 1,000 μm^2.

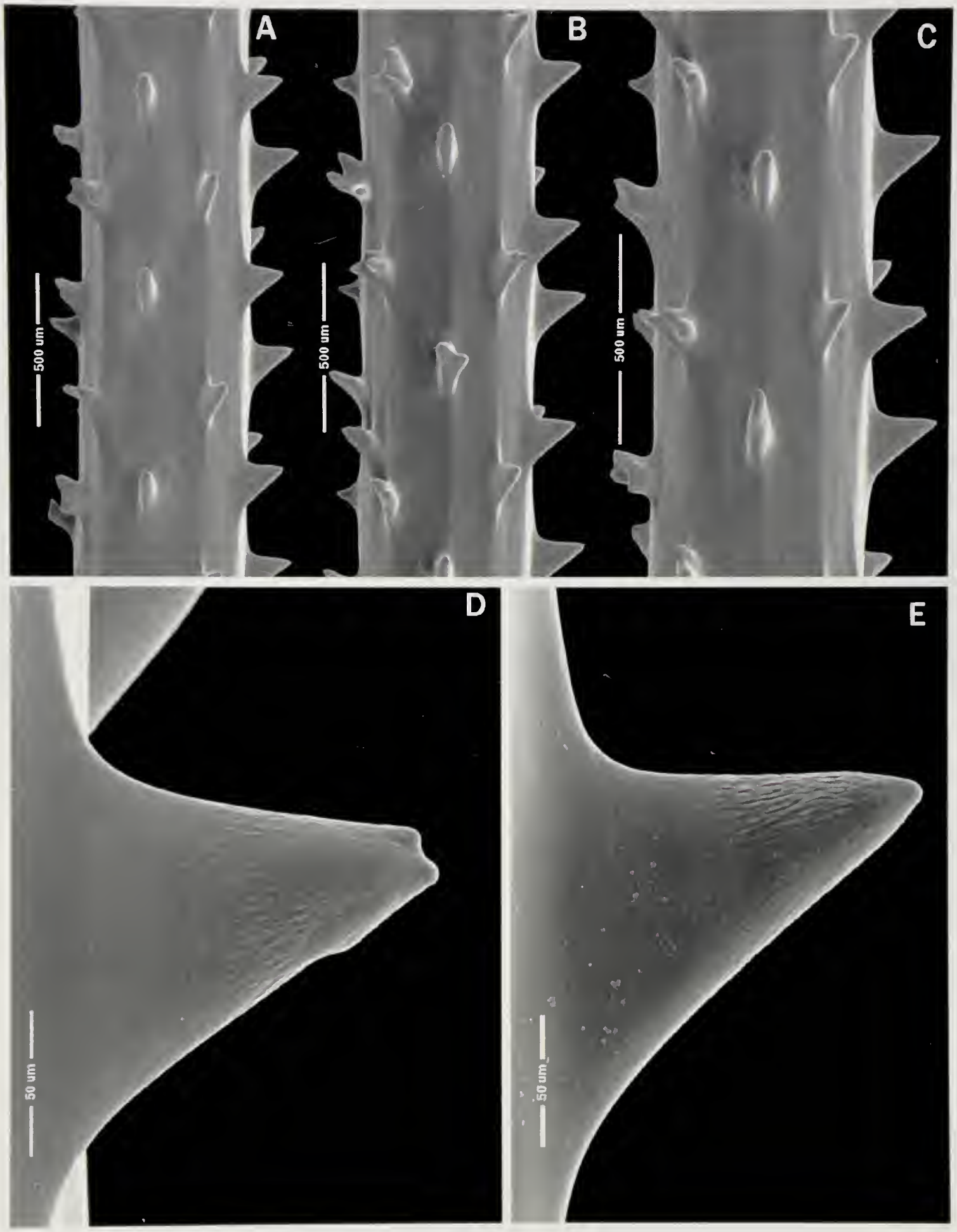

Figure 3. Schizolectotype of *Stichopathes pourtalesi* Brook (from MCZ 90342). A–C, sections of stem showing the occurrence of both bifid and simple spines. D, E, close-up view of two spines showing the surface papillae and slight apical bifurcation.

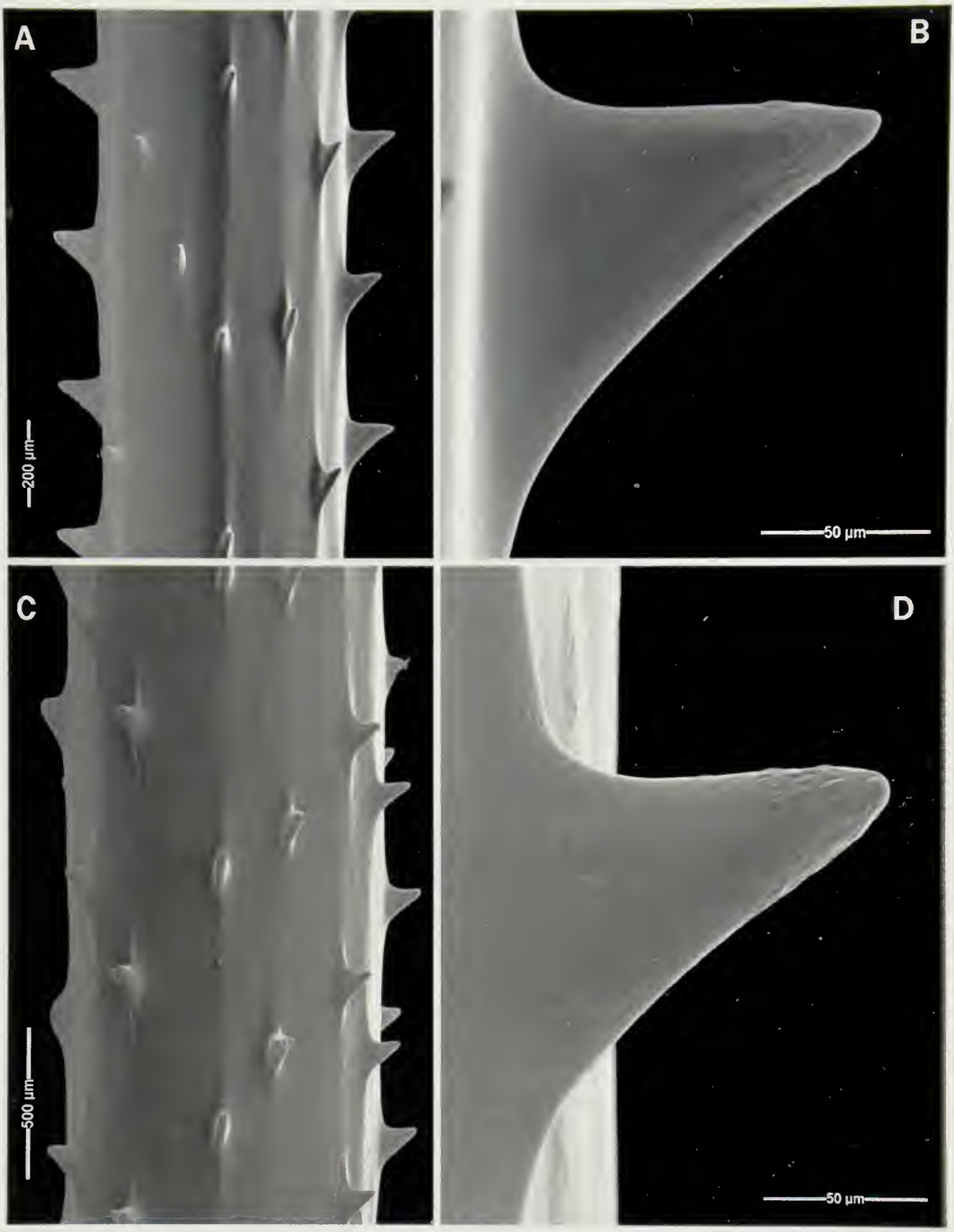

Figure 4. Schizoparalectotype of *Stichopathes pourtalesi* Brook (from MCZ 90343). A and C, two sections of the stem showing the arrangement and size of the spines. B and D, single spines with faint papillae.

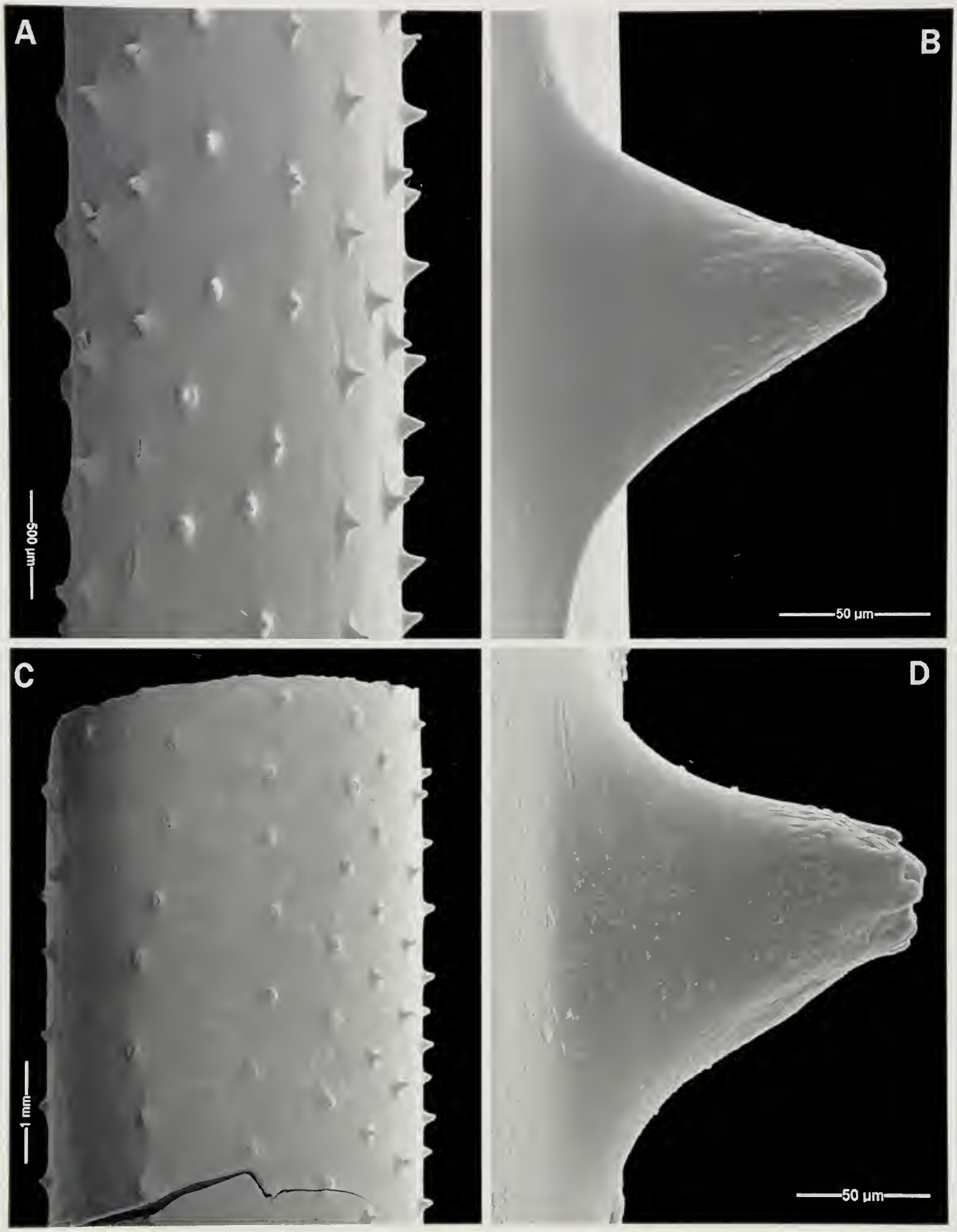

Figure 5. Schizoparalectotype of *Stichopathes pourtalesi* Brook (from MCZ 90343). A and C, arrangement of spines along the thicker section of the stem. B and D, single spines with papillae and apical lobes.

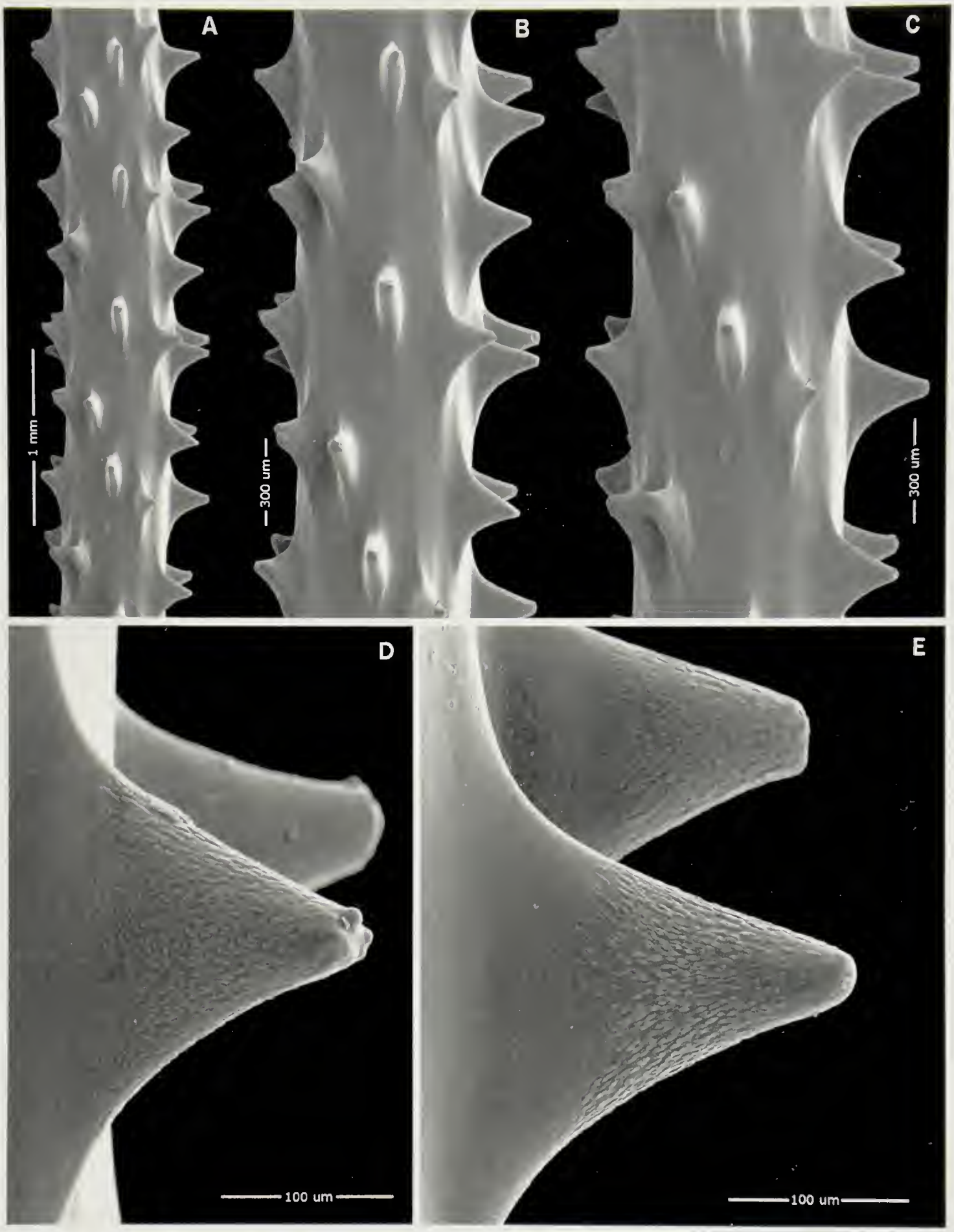

Figure 6. Schizoholotype of *Stichopathes gracilis* Gray (USNM 100363; from BM Reg. No. 23.1.16.10). A–C, one section of stem shown at increasing magnification. D, E, individual spines showing surface papillae and small apical knobs.

TABLE 3. REIDENTIFICATIONS OF THE SYNTYPES OF *STICHOPATHES POURTALESI* BROOK.

Species/Group	Syntypes[1]
S. pourtalesi sensu stricto	MCZ 66253, MCZ 66387, MCZ 90342, MCZ 90343 (1), MCZ 90343 (2), MCZ 90347, MCZ 90348, MCZ 90353, MCZ 90355, MCZ 90356, MCZ 90357 (1), MCZ 90357 (2), MCZ 90357 (3), MCZ 90357 (4), MCZ 90358 (1), MCZ 90358 (2), MCZ 90358 (3), MCZ 90358 (4), MCZ 90361 (1), MCZ 90361 (2)
Stichopathes spp. group A (Spines taller than in *S. pourtalesi sensu stricto* with sparse to dense tubercles or minute papillae)	MCZ 66251 (1), MCZ 66251(2), MCZ 66251(3); MCZ 66385 (1), MCZ 66385 (2), MCZ 66385 (3), MCZ 66385 (4), MCZ 66385 (5), MCZ 66386, MCZ 90340, MCZ 90341, MCZ 90344, MCZ 90350, MCZ 90360 (1), MCZ 90360 (2), MCZ 90360 (3), MCZ 90362, MCZ 90363, MCZ 90365 (1), MCZ 90365 (2), MCZ 90365 (3)
Stichopathes spp. group B (Spines shorter than in *S. pourtalesi sensu stricto* with distinct tubercles or minute papillae)	MCZ 90337, MCZ 90338, MCZ 90339, MCZ 90349, MCZ 90351, MCZ 90352, MCZ 90354 (1), MCZ 90354 (2), MCZ 90359
Aphanipathidae?	MCZ 90364

[1]Number in parentheses after MCZ catalogue number designates a specific specimen from that lot as assigned by the study authors.

On the basis of the information given above, *S. pourtalesi* differs from *S. gracilis* in the maximum size of the polypar spines (generally less than 0.17 mm vs. 0.22 mm), the maximum size of the polyps (1.7 mm vs. 2.0 mm), the maximum density of the polyps (seven per millimeter vs. five per millimeter), and the shape of the papillae on the surface of the spines (distinctly elongated in *pourtalesi* and round to slightly elongated in *gracilis*). The shape of the papillae is considered a key feature in separating the two taxa, and illustrates the importance of evaluating high-resolution images of individual spines.

Distribution. On the basis of the syntypes assigned to *S. pourtalesi*, the species occurs in the Caribbean Sea and Gulf of Mexico (Montserrat, Yucatan Bank, Barbados, Martinique, Florida, St. Vincent, and Grenadines) at depths ranging from 82 to 299 m.

Remarks on Other Specimens in the Type Series. Not all the specimens referred by de Pourtalès to *A. spiralis* Pallas conform to the diagnosis and description given above. At least three other species groups may be represented in the type series (Table 3). These are discussed below:

1. Syntypes with relatively tall spines with papillae or distinct tubercles (see group A in Table 3).

   Colonies are typically coiled or spiral; the coils are 6 or 7 cm in diameter. In the most complete specimens, the lower portion of the stem is straight, whereas the upper part is twisted in loose coils. The polyps up to 2.5 mm in transverse diameter, interpolypar space 0.8 to 1.2 mm, with three to four polyps per centimeter and sagittal tentacles up to 2.4 mm long. Polypar spines up to 0.32 mm tall (as measured from apex of spine through the center to the base); abpolypar spines one-half to two-thirds size of polypar spines; mutual distance of spines mostly 0.9 to 1 mm; number of rows usually five or six. In almost all specimens, distinct apical tubercles are present on spines from all regions of the

stem: apex, mid-portion, and base (Figs. 7, 8C).

A comparison with other nominal species of *Stichopathes* indicates that these specimens are related to two other nominal species of *Stichopathes*: *S. paucispina* Brook, on the basis of the expanded description of the latter species by Opresko and Genin (1990), and *S. dissimilis* Roule (1902, see also Roule, 1905). In *S. paucispina* the polypar spines are up to 0.32 mm tall and the abpolypar spines up to about 0.24 mm. Both the polypar and abpolypar spines have distinct tubercles (12 to about 17 seen in one lateral view of a single spine) near the apex. Polyps occur in two sizes, arranged in a single, straight row. The larger polyps are 2.3 to 3.4 mm in transverse diameter and the smaller polyps 0.8 to 1.2 mm, with 2.5 to three polyps occurring along 1 cm of axis. Sagittal tentacles up to 4 mm long in larger polyps, usually slightly longer than proximal lateral tentacles; distal lateral tentacles up to 2 mm in the largest polyps.

Also included in group A (Table 3) are specimens with tall spines that have only a small number of tubercles (Fig. 8B), or with surface features that resemble small papillae rather than distinct tubercles (Fig. 8A). Further study is needed to determine if these forms represent different species or only variants of the species mentioned above.

2. Syntypes with small polyps and extremely small spines (see Table 3 and Figs. 8D, E). All specimens form thin, coiled colonies. Spines are simple, triangular, and subequal (0.04–0.1 mm tall on the polypar side and 0.02–0.06 mm on the abpolypar side); arranged in four to five longitudinal rows (one view); and are 0.2–0.6 mm apart in each row. Spines are slightly (Fig. 8D) to distinctly papillose (Fig. 8E) over one-third to two-thirds of the apical surface and, in numerous specimens, are arranged in distinct verticils along the apical or central portion of the stem. Polyps are around 1 mm in transverse diameter, and are variably spaced with five to nine polyps per centimeter (the poor state of preservation of the soft tissues in many specimens does not allow precise measurements). Polypar density tends to decrease toward the apex of the stem.
3. Syntype with extremely tall spines (Fig. 8F): MCZ 90364. One specimen in three pieces totaling about 13 cm, with no soft tissue remaining. Spines 0.52–0.65 mm; somewhat club-shaped, with very papillose surface; subequal in length. A basal holdfast was not clearly present, but a slight expansion of the sclerenchyme at the thickest end suggests that the specimen might have been a branch or pinnule from a branched or pinnulated colony. The size and shape of the spines suggest that the specimen might belong to a species in the family Aphanipathidae.

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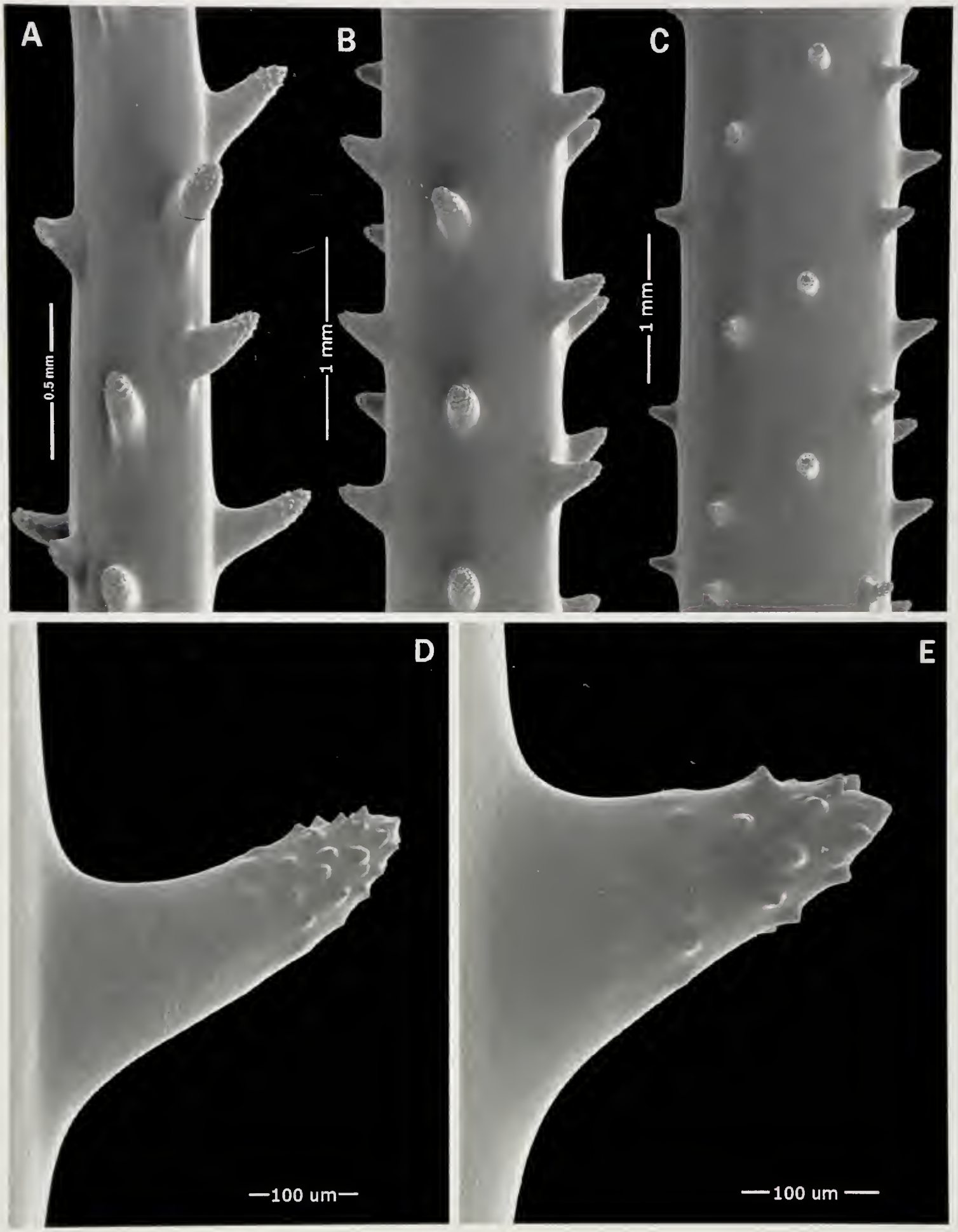

Figure 7. *Stichopathes* sp. (syntype of *S. pourtalesi* Brook) from Blake Sta. 131 (MCZ 90344). A–C, sections of stem of increasing diameter. D, E, single spines showing close-up view of surface tubercles.

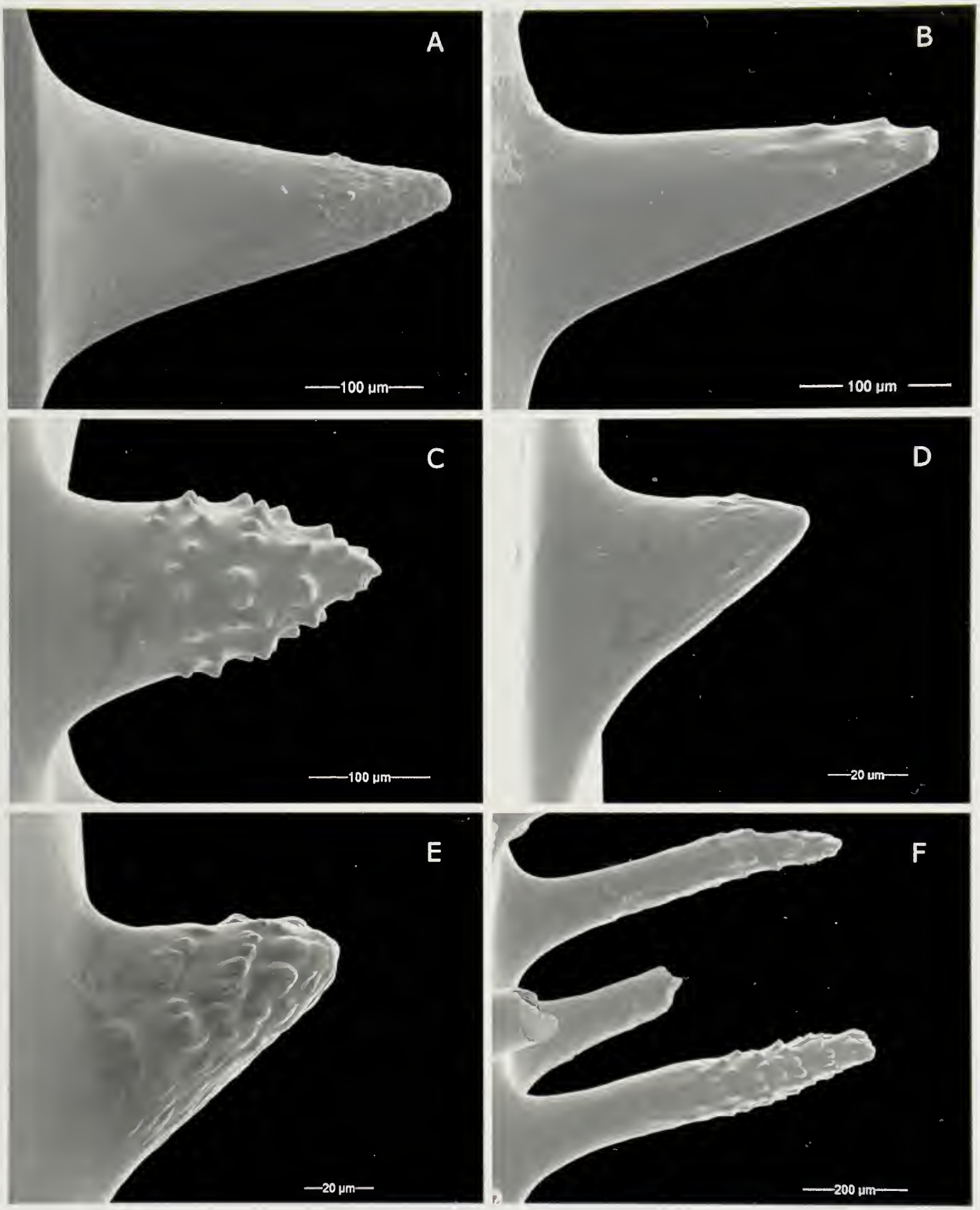

Figure 8. *Stichopathes* spp. (syntypes of *S. pourtalesi* Brook). A, single polypar spine from MCZ 90350. B, single polypar spine from MCZ 90362. C, single polypar spine from MCZ 66385. D, single polypar spine from MCZ 90337. E, single polypar spine from MCZ 90354. F, several polypar spines from MCZ 90364.

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